

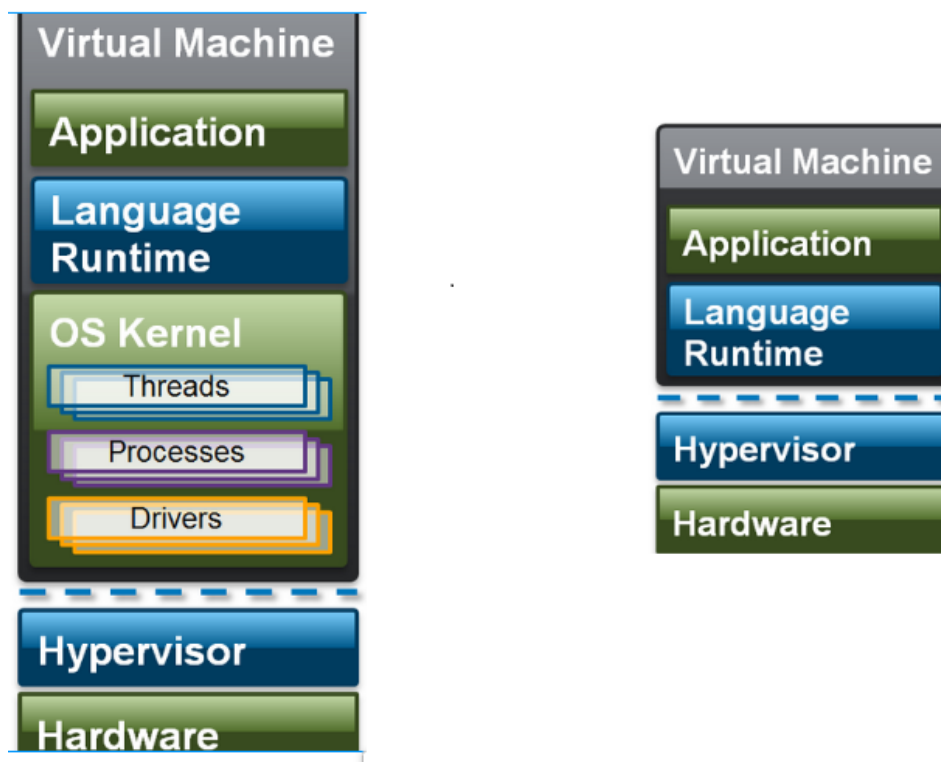
# Introduction to Virtualization

## Virtualization Architecture

<http://en.wikipedia.org/wiki/Hypervisor>

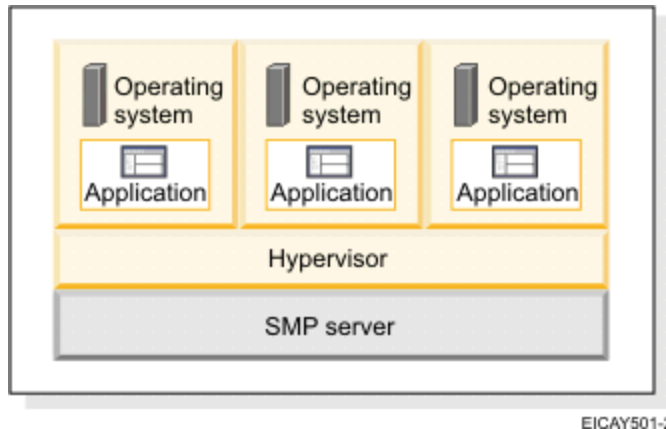
A **hypervisor** or **virtual machine monitor (VMM)** is a piece of computer software, firmware or hardware that creates and runs [virtual machines](#).

System virtualization can be approached through hardware partitioning or hypervisor technology

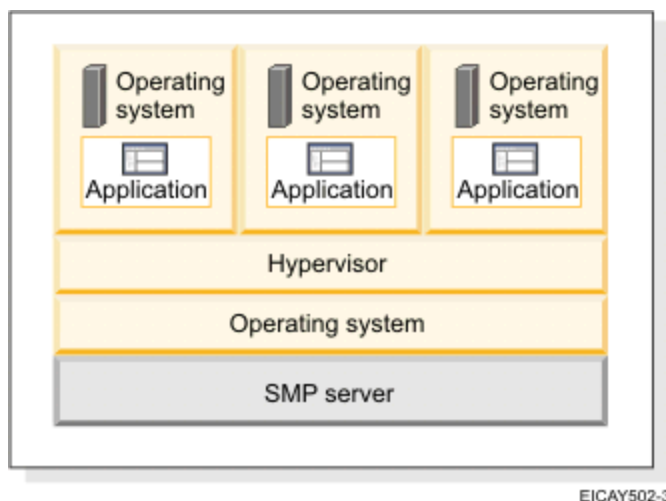


Hardware partitioning subdivides a physical server into fractions, each of which can run an operating system. These fractions are typically created with coarse units of allocation, such as whole processors or physical boards. This type of virtualization allows for hardware consolidation, but does not have the full benefits of resource sharing and emulation offered by hypervisors. Hypervisors use allows fine-grained, dynamic resource sharing. Because hypervisors provide the greatest level of flexibility in how virtual resources are defined and managed, they are the primary technology of choice for system virtualization.

There are two types of hypervisors. Type 1 hypervisors run directly on the system hardware. The following figure shows one physical system with a type 1 hypervisor running directly on the system hardware, and three virtual systems using virtual resources provided by the hypervisor.



Type 2 hypervisors run on a host operating system that provides virtualization services, such as I/O device support and memory management. The following figure shows one physical system with a type 2 hypervisor running on a host operating system and three virtual systems using the virtual resources provided by the hypervisor.



Important Hypervisors

Hypervisor	Hypervisor type
Kernel Based Virtual Machine	Type 1
Red Hat Enterprise Virtualization (RHEV)	Type 1
VMware vSphere	Type 1
Microsoft Windows Server 2012 Hyper-V	Type 1
Citrix XenServer	Type 1
VirtualBox	Type 2
VMWare Workstation	Type 2

Type 1 hypervisors are typically the preferred approach because they can achieve higher virtualization efficiency by dealing directly with the hardware. Type 1 hypervisors provide higher performance efficiency, availability, and security than type 2 hypervisors. Type 2 hypervisors are used mainly on client systems where efficiency is less critical. Type 2 hypervisors are also used mainly on systems where support for a broad range of I/O devices is important and can be provided by the host operating system